behavior was observed in this study, which indicates that the likelihood of encountering a very narrowband of vitamin D values for patients with high disease activity is very high, and thus, the forecast capability of vitamin D values for patients with increasingly active disease is quite good. Future research will aim at strengthening the statistical parameters of relevance, identifying and characterizing the more specific behaviours of this global pattern.

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AB0301 CARDIOVASCULAR RISK AND END ORGAN DAMAGE IN AN ITALIAN GROUP OF PATIENTS WITH RHEUMATOID ARTHRITIS

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Background: The elevated cardiovascular burden of rheumatoid arthritis is well known and the recent update of EULAR recommendations for cardiovascular disease management (1) establish as overarching principle that the rheumatologist is responsible for CVD risk management in patients with RA. They highlight the need of optimal disease activity control, regular CVD risk assessment, lifestyle counseling, appropriate prescription of NSAIDs, corticosteroids, antihypertensives and statins. Screening for asymptomatic atherosclerotic plaques by use of carotid ultrasound is also suggested: the presence of carotid plaques is associated with poor CVD-free survival and is strongly linked to future acute coronary syndrome in RA patients.

Objectives: We performed an overall cardiovascular assessment to evaluate the presence of end-organ damage in a group of RA patients.

Methods: We carried out non-invasive 24 hours ambulatory blood pressure monitoring, echocardiography, carotid doppler ultrasound and pulse wave velocity (PWV) in a group of RA patients to optimize non-DMARDs therapy and to evaluate end organ damage.

Results: 55 RA patients, 76.4% female, mean age 62.8±9 yrs were examined. The median disease duration was 12 yrs. 84% were RF +, 80% ACPA + and 51% had erosions. Mean DAS 28 CRP was 2.82±1.23 and HAQ 0.54±0.6. All pts were treated with cDMARDs and/or bDMARDs (54%) and Pd mean dosage was ≤5 mg/day. Only 3 patients had previous CV event. 49% were hypertensive, 25% had high cholesterol, 13% diabetes and 16% were smokers: median BMI was 25. MAP monitoring revealed that 43/55 (78%) pts were hypertensive: 13 of them had unknown or not/under treated hypertension: 63% had dipper profile and only 12% were reverse dipper. We did not find increased left ventricular mass and wall thickness, but left ventricular diastolic dysfunction grade I-II was found in 26/55 pts, not related to hypertension nor to RA activity. The IMT median value was 655 mm; only in 3 pts was >900 mm: no relation with disease activity was found. In 11 pts carotid plaques were present and related with age, BMI and ambulatory mean pressure values, but not with RA activity or duration. In one patient the plaque required carotid endarterectomy. The PWV median value was >10m/s in 16 pts, all hypertensive.

Conclusions: The accurate evaluation of cardiovascular involvement of this small group of RA patients shows that hypertension is frequent and often not appropriately treated and seems to be the main cause of the increased PWV. Low grade LV diastolic dysfunction was found in half of patients, with no relation with hypertension or RA features, except for CCP presence, but the small numbers do not allow any speculation. Carotid artery involvement was present in 20% of pts, but only in 1 was clinically significant. Once again no relation with RA features was found: the small number of patients, the low disease activity and the tight and overall clinical control could be partial explanations. The clinical tight control of patients with RA is an unique opportunity to fulfill EULAR recommendations.

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AB0302 WORKABILITY IN PATIENTS WITH SEROPOSITIVE RHEUMATOID ARTHRITIS

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Background: Rheumatoid arthritis (RA) and other rheumatic conditions can lead to work disability, and temporary or permanent exit from the labour market. The indirect costs related to work disability, are higher than direct treatment costs, and pose an economic burden on patients and society. Workability in RA is influenced by many factors, including symptoms, such as pain, swelling and stiffness, muscle strength, or physical or mental exhaustion, which are components of the frailty syndrome.

Objectives: This study aimed to determine the association of workability with disease activity, pain, functional disability and frailty in patients with seropositive rheumatoid arthritis.

Methods: We conducted a monocentric cross-sectional study at a rheumatologic outpatient clinic and day hospital including 100 seropositive RA patients (according to 2010 EULAR classification) in the working age (<65 years). Workability was assessed with the self-administered Work Ability Index questionnaire. For disease activity, we used the Clinical Disease Activity Index (CDAI), a Visual analogue scale for pain assessment, for functional disability the self-administered Health Assessment Questionnaire Disability Index (HAQ-DI) and for the degree of frailty the SHARE Frailty Instrument (SHARE-FI). After testing for normal distribution, bivariate correlations between workability and associated variables were calculated using Spearman's correlation coefficients.

Results: Of 100 patients for 58 the workability index could be assessed. The remaining 42 were either unemployed, on disability pension, or employed but currently not working. These 58 patients, 37 women and 21 men, had an average age of 64.8 years (min-max=22–59, SD=9.3) and an average disease duration of 93.9 months (min-max=3–360, SD=86.7). 8 patients reported excellent workability, 27 good workability, 16 moderate workability and 7 poor workability. The workability was weakly correlated with age ($r_s = -0.37$, $p < 0.004$), and moderately correlated with pain intensity ($r_s = 0.42$, $p < 0.001$), disease activity ($r_s = 0.40$, $p < 0.002$), functional disability ($r_s = 0.64$, $p < 0.000$) and frailty ($r_s = 0.623$, $p < 0.000$).

Conclusions: A considerable portion of employed RA patients reported poor or moderate workability, which is significantly associated with disease activity but also with the other parameters assessed. An adequate therapy may therefore not only improve well-being and state of health in RA patients but also provide socioeconomically advantage by maintaining patients' workability.

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AB0303 DOES COMORBIDITY ADVERSELY IMPACT ON TREATMENT RESPONSE IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Background: The burden of comorbid illness in Rheumatoid Arthritis is high. Whilst there can be coincidental existence of comorbidity, it can be attributed to the disease process itself or therapeutic agents. Recent EULAR guidelines recommend reporting, screening and prevention of six common co-morbidities (cardiovascular, malignancy, infections, gastrointestinal, osteoporosis, depression). Limited research is available evaluating the impact of comorbidity on disease response following biologic treatment.

Objectives: To analyse retrospective data from the King's College Hospital (KCH) Virtual Biologic Clinic (VBC) to assess the impact of comorbidity on disease response following treatment with biologics.

Methods: Retrospective patient note review data was collected for patients referred to the VBC from May 2013 to July 2016. The following data was recorded: age, sex, disease duration, smoking status, BMI, presence or absence of Anti CCP antibody +/-Rheumatoid factor and the six specified comorbidities. Disease Activity Score in 28 joints (DAS28) at time of referral for biologic and within 6 months of commencing treatment was also recorded in order to calculate treatment response.

The impact of comorbidity and disease variables on 6 month EULAR response were analysed using logistic regression (SPSS version 23).

Results: The database contained 150 patients. 18 patients were excluded due to no follow-up DAS28, leaving 132 for analysis. Mean age and disease duration were 58 years and 10.45 years respectively. Comorbidity was present in 70% of patients. 70% of patients achieved a EULAR moderate response (improvement of >1.2 of DAS28) and 36% of this group achieved EULAR good response (DAS28<3.2). The most prevalent comorbidities were infection, cardiovascular disease and depression.

Logistic regression analysis was run analysing EULAR moderate response against presence of comorbidity and dataset variables (age, gender, serostatus, baseline DAS, HAQ and polypharmacy). The resulting model was not statistically significant ($p=0.975$).

Logistic regression analysis looking at EULAR good response against presence of comorbidity was also not statistically significant ($p=0.149$). Analysis looking at EULAR good response against three variables (HAQ, baseline DAS and serostatus) was found to be statistically significant ($p<0.001$)

Characteristics	All N=132	No EULAR moderate response N=40	EULAR moderate response N=92	EULAR good response N=34
Age years (SD)	58 (13)	56 (10)	59 (14)	57 (11)
Gender (%F)	79%	72.5%	81.5%	76%
Positive serostatus	77%	65%	82%	74%
RA Disease duration (years) (SD)	10.45 (10.81)	10.70 (11.47)	10.34 (10.52)	10.54 (10.74)
Prior biologic use	55%	60%	52.2%	32%
Comorbidity	70%	80%	82%	62%
Baseline DAS28 (SD)	6.27 (0.93)	6.27 (0.93)	6.28 (0.93)	6.26 (0.93)
Mean DAS improvement (SD)	1.97 (1.57)	1.97 (1.57)	1.99 (1.58)	1.95 (1.58)

Conclusions: Comorbidities were present in the majority of patients assessed

(70%). Results show no significant relationship between EULAR moderate response or EULAR good response and the presence of comorbidity. Lower HAQ, lower baseline DAS28 and seronegativity contribute towards good treatment response. The limitations of this study include gaps in clinical records, absence of patient reported questionnaires, and small size of database.

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AB0304 SERUM LEVELS OF SCLEROSTIN AND DICKKOPF-1, AND THEIR CORRELATION WITH BONE MINERAL DENSITY AND BONE MARKERS IN RHEUMATOID ARTHRITIS

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Background: Sclerostin (SOST) and dickkopf-1 (DKK1) are involved in the development of primary osteoporosis. Although to date, it is controverted does exist about if serum levels of these molecules may reflex adequately a subgroup of patients with decrement of Bone Mineral Density (BMD) being useful as clinical biomarkers. Some non-conclusive observations made in postmenopausal osteoporosis have shown abnormalities in serum levels. To date, there is a lack of information about if these serum molecules are associated with a decrease of BMD in RA. This information is relevant for to know if the measurement of these serum molecules could be useful in the clinical care to identify a subgroup of patients with low BMD.

Objectives: To evaluate if serum levels of SOST and DKK1 correlate with bone mineral density and other bone markers in RA.

Methods: In this Cross-sectional study, we included 115 women with RA >40 years old. All patients were assessed for clinical characteristics disease activity (DAS28) and functioning (HAQ-Di). BMD was measured in lumbar spine, hip and forearm using DXA. According to their results, osteoporosis was identified if the BMD in a patient had a T-score with a decrement of ≤ -2.5 standard deviation (SD). According to their results we classified these patients in two groups: a) low BMD (T-score ≤ -1 SD on lumbar spine or total hip) and b) normal BMD (T-score > -1 SD). Serum SOST, DKK1, including serum Receptor Activator of NF- κ B Ligand (sRANKL) and osteoprotegerin (OPG) were quantified by ELISA. We compared serum levels between the groups using Student t-tests. For comparisons between proportions we performed Chi-square test (or Fisher exact test if required). Correlations between serum levels of SOST, DKK1, with BMD, clinical variables, sRANKL and OPG we performed Pearson correlation tests.

Results: From the 115 women with RA, 58 patients had low BMD (50.4%), from them 44 patients (38.3%) had osteoporosis. Patients in the group with low BMD had higher age (63 ± 8 vs 53 ± 9 , $p < 0.0001$), DAS28 (4.1 ± 1.5 vs 3.3 ± 1.4 , $p = 0.011$), and HAQ-Di score (0.69 ± 0.53 vs 0.36 ± 0.47 , $p = 0.001$) compared with normal BMD; whereas lower serum levels of sclerostin was observed in the low BMD group (128.5 ± 75.0 vs 178.2 ± 103.3 , $p = 0.004$). SOST levels were correlated with BMD in lumbar spine ($r = 0.393$, $p < 0.0001$), hip ($r = 0.388$, $p < 0.0001$) and forearm ($r = 0.319$, $p = 0.001$). sRANKL serum levels had a negative correlation with BMD in hip ($r = -0.17$, $p = 0.03$). No correlations were observed between serum DKK1 and OPG with BMD in hip or lumbar spine.

Conclusions: These results indicate that SOST, and RANKL are biomarkers may associated with abnormal BMD in RA. Further long-term follow-up studies should evaluate if high levels of these serum biomarkers could be useful as tests to predict the future development of osteoporotic fractures.

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AB0305 FACTORS CONSIDERED BY RHEUMATOLOGISTS TO DECIDE TREATMENT DURING RHEUMATOID ARTHRITIS PATIENT'S FOLLOW-UP

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Background: Disease activity (DA) is the most important factor in the treatment decision during rheumatoid arthritis (RA) patient's follow-up. In routine clinical

practice, it is recommended to regularly evaluate DA and musculoskeletal ultrasound has been suggested to add value to establish the level of DA. Nevertheless, the final treatment proposal also requires considering additional factors. In a previous clinical study performed in the setting of an early arthritis clinic, we found that in 20% of the clinical scenarios evaluated, the German ultrasound score of 7 joints (GUS-7) (1) findings impacted the rheumatologist's treatment proposal; the impact was more frequent among the trainee in rheumatology (TR) than among the senior rheumatologist (SR).

Objectives: To determine and rate, which among the following factors were determinant to recommend a treatment in the same population of RA patients above described: the clinical assessment, the GUS-7, comorbidities, treatment-related adverse events, DMARDs costs/availability, patient's preference and DMARD maximum dose. We also compared if factors differed between both physicians.

Methods: Eighty-seven consecutive and randomly selected RA outpatients were invited to participate; 2 patients denied and 85 patients underwent 170 assessments (85 each by the SR and the TR); at first, both physicians (blinded to each other) performed a clinical evaluation that included DAS28 scoring and recommended a RA-treatment. Then, patients underwent GUS-7 by a blinded (to clinical evaluations) rheumatologist. In the final step, the TR and the SR integrated the US findings to their previous evaluation and reviewed their prescription; also, both physicians recorded and rated on a standardized format which of the factors above described were determinant in the final treatment proposal. Patients signed informed consent and were instructed about the process. Only the SR met each patient for the final recommendation. Descriptive statistics was used.

Results: Patients were primarily middle-aged female (91.4%) and had (mean $\pm$ SD) follow-up of 7.5 ± 3.9 years. The majority of them were in DAS28-remission (72%). Clinical assessment (DAS28) was rated as determinant in the totality of the clinical scenarios (100%), followed by GUS-7 in 84.7%, DMARD maximum dose in 41.2%, comorbidities in 23.5%, DMARD cost/availability in 21.2%, treatment-related adverse events in 20% and patient's preference in 14.1% of them. The SR and the TR differed in their selection: GUS-7 and treatment-related adverse events were more frequently considered determinant for the TR (45.9% vs. 38.8%, $p = 0.01$ and 12.9% vs. 7.1%, $p = 0.08$), meanwhile the opposite figure was true for DMARD cost/availability (4.7% vs. 16.5%, $p \leq 0.001$) and DMARDs maximum doses (17.1% vs. 24.1%, $p = 0.08$).

Conclusions: in a real clinical setting, DA assessed by DAS28 and by musculoskeletal ultrasound were the most important factors to determine the treatment of RA outpatients; additional factors were considered and differently rated by TR and SR.

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Disclosure of Interest: None declared

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AB0306 CAPLAN'S SYNDROME, CADMIUM AND CHINA CLAY: COULD OCCUPATIONAL KAOLIN INHALATION ENHANCE CADMIUM EXPOSURE TO EXPLAIN THE SIXTY YEAR CONUNDRUM OF CAPLAN'S SYNDROME FIRST REPORTED IN COAL MINERS?

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Background: Caplan's syndrome was first described in the coal miners of South Wales (UK). The specific cause for rheumatoid pulmonary nodules associated with coal dust exposure remains unknown. Coal dust exposure alone does not appear to explain Caplan's syndrome as almost all of these men were also smokers. Cigarette smoke is the most important environmental cause of cadmium exposure. We describe Caplan's syndrome in an ex-smoking kaolin worker associated with a significantly raised urinary cadmium level.

Objectives: A 65 year old Cornish kaolin worker and ex-smoker of 20 pack years with life limiting nodular erosive rheumatoid arthritis (RA), developed extra-articular manifestations including pulmonary nodules suggestive of Caplan's syndrome. We review the literature on kaolin, with respect to inhalation and mechanism of action for heavy metal adsorption and nodular disease development.

Methods: Pubmed searches were undertaken using the keywords "kaolinoses", "kaolin", "cadmium", "nodules", "adsorption", "coal". First pass mid-stream urine was analysed for cadmium using inductively coupled plasma-mass spectrometry (ICP-MS).¹

Results: Urinary cadmium was significantly raised at $0.66 \mu\text{mol/mol}$ creatinine (non-occupationally exposed UK male median $0.17 \mu\text{mol/mol}$ creatinine¹), 20 years post-industrial exposure and 35 years post-smoking cessation. Contemporary serology levels demonstrated a rheumatoid factor of 481.7 iu/ml (0–10 normal range) and an anti-cyclic citrullinated peptide of $>500 \text{ u/ml}$ (0–17 normal range). CT scan of the chest demonstrated multiple pulmonary nodules consistent with Caplan's syndrome.

The prevalence of Caplan's syndrome in kaolin workers is the highest of any occupation ever reported.² Elevated cadmium levels of $11.2\text{--}15.9 \text{ mg/kg}$ have been observed in kaolin,³ fifty-fold higher than those reported in coal.⁴ Coal contains variable amounts of clays and minerals such as kaolinite. Cadmium content in coal is strongly associated with levels of kaolinite contamination.⁴ Cadmium